

AGATHODONTA NORTONI, NEW SPECIES: LIVING MEMBER OF A LOWER CRETACEOUS TROCHID GENUS

James H. McLean

Los Angeles County Museum of Natural History
900 Exposition Boulevard
Los Angeles, CA 90007

ABSTRACT

Agathodonta nortoni, new species, from archibenthal (300 meter) depths in the Philippines, represents a living record of a genus presumed extinct since the Lower Cretaceous. It is assigned to the tribe Chilodontini, subfamily Margaritinae, in agreement with an earlier placement of other living genera in this group.

In a preliminary report on classification of the trochid subfamily Margaritinae (McLean, 1982), I assigned such Recent genera as *Euchelus* Philippi, 1847, *Danilia* Brusina, 1865, and *Turcica* A. Adams, 1854, to the tribe Chilodontini of the subfamily Margaritinae, a group previously regarded as limited to the Mesozoic, Middle Triassic through Upper Cretaceous. My allocation of these genera was based on a similarity of sculpture, aperture shape, and apertural dentition among the fossil and living genera.

Here I describe a new Recent species of the chilodontine genus *Agathodonta* Cossmann, 1918, which until now had been known only in the European Neocomian and Albian Stages of the Lower Cretaceous, 110 to 135 million years in age. This living link to such Mesozoic genera as *Pseudoclanculus* Cossmann, 1918, *Chilodontoidea* Huddleston, 1896, *Wilsoniconcha* Wenz, 1939, *Chilodonta* Etallon, 1862, and the Recent genera mentioned above is a further indication that the Recent genera are related to the fossil genera of the Chilodontini.

Shell characters of the chilodontine genera are: clathrate sculpture, some expression of apertural dentition, and an oblique aperture with the entire apertural rim in the same plane, enabling a close fit against the substrate. Living genera have epipodial and radular features in common, essentially as described by Beu and Climo (1974) for their new species *Danilia insperata*. Based on shell and radular characters, *Mirachelus* Woodring, 1928, is also a member of the group.

This and my earlier note (McLean, 1982), are preliminary to a full revision of higher classifica-

tion in the Trochacea (in collaboration with C. S. Hickman), in which epipodial and radular characters of chilodontine genera will be illustrated.

Genus *Agathodonta* Cossmann, 1918

Agathodonta Cossmann, 1918: 200; Wenz, 1938: 296 [as "*Agnathodonta*"]; Cox, in Knight *et al.*, 1960: 249. Type species (original designation): *Trochus dentigerus* Orbigny, 1843. Lower Cretaceous (Neocomian).

Agathodonta dentigera (Orbigny, 1843)

Trochus dentigerus Orbigny, 1843: 185, pl. 77, figs. 9-12.
Agathodonta dentigera, Cossmann, 1918: 200, pl. 7, figs. 8-11; Wenz, 1938: 298, fig. 653; Cox, in Knight *et al.* 1960: 249, fig. 160, 2.

"High turbiniform, anomphalous, with strongly convex whorls and base; ornament granose spiral cords; columellar lip with two strong, obtuse teeth." Cox, in Knight *et al.* (1960).

In addition to the type species, Cossmann (1918) referred two other species to *Agathodonta*: *Trochus guyotianus* and *T. tollotianus*, both of Pictet et Roux, 1849, from the Albian Stage of the Lower Cretaceous.

Agathodonta is characterized by two pronounced columellar plications, a trait shared with the Jurassic *Wilsoniconcha* Wenz, 1939, which differs in having a pupiform shape, and the Recent *Turcica*, which has a much larger shell with flat-sided whorls. *Turcica* was assigned by Keen, in Knight *et al.* (1960), to the Monodontinae, but is related to *Euchelus* and *Danilia* on the basis of radular, and epipodial characters.

The genus *Danilia*, recently reviewed by Beu & Climo (1974), differs from *Agathodonta* in having an exterior thickening of the final lip, and in

having a single columellar plication. According to these authors, *Danilia* has a fossil record dating from the Lower Cretaceous (Albian), nearly as old as *Agathodonta*. Six living species of *Danilia* were reported to occur offshore in archibenthal depths similar to those in which our new species of *Agathodonta* is found.

The only living trochacean genus with a longer fossil record than that of *Agathodonta* is *Angaria* Röding, 1798, which dates from the Upper Jurassic (Cox in Knight *et al.*, 1960). Rather few living trochacean genera originated as early as in the Mesozoic. Aside from *Angaria*, *Agathodonta*, and *Danilia*, only 13 additional living trochacean genera were reported by Keen, in Knight *et al.* (1960), in the Mesozoic, all in the Upper Cretaceous.

***Agathodonta nortoni*, new species**

Figures 1-3

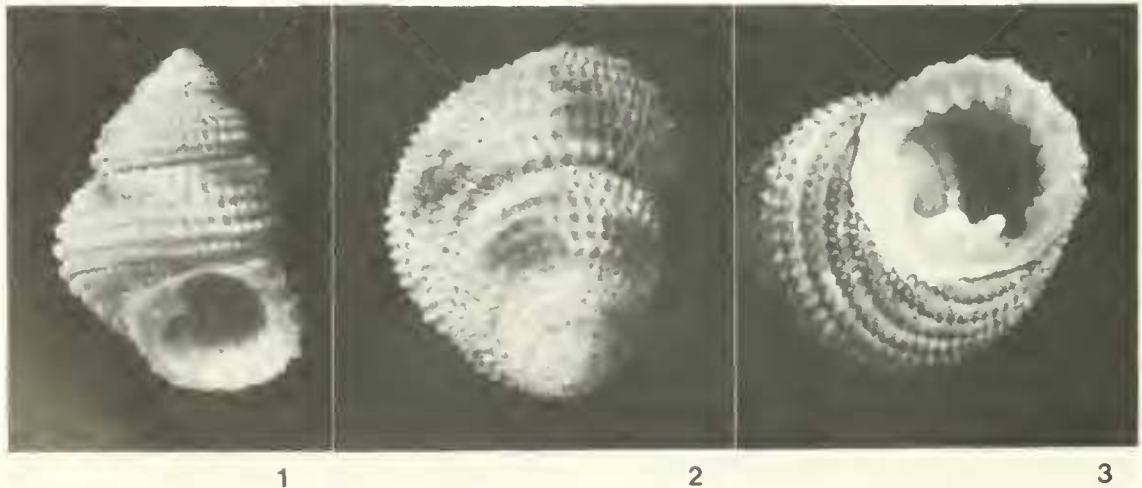
Description of holotype—Shell small; height 10.6 mm, maximum diameter 7.8 mm. Periostracum thin, in lamellar ridges; color uniformly buff with scattered, irregular brown markings. Protoconch eroded, teleoconch whorls 5½; whorls rounded, suture deeply impressed, slightly descending on last whorl; aperture markedly oblique; umbilicus absent. Spiral sculpture of strong cords and equal interspaces: 3 on 2nd whorl, 4 on third whorl, 6 on 4th and penultimate whorl, seventh cord emerging at

aperture; base with 3 additional cords. Axial sculpture of oblique ribs weaker than spiral cords, producing strong projecting nodes at intersections. Aperture circular, nacreous within; columellar wall with two strong projecting folds, uppermost the larger, with notch and adjacent denticle below the two main plications; columellar shield forming a slightly raised peritreme, nearly concealing spiral sculpture over which it lies; columellar shield with 6 low tubercles. Lip thickened by apertural ridge within, with 9 lirae corresponding to interspaces of exterior spiral cords; apertural ridge with single, small pustules between lirae. Chitinous operculum present.

Type locality—296-320 m on sand bottom, off Baltazar Island, Marinduque Province, Philippine islands (approximately 13°14'N; 121°49'E) (coordinates of island, U.S. Board on Geographic Names Gazetteer).

Holotype—Los Angeles County Museum of Natural History (LACM), cat no. 2031, collected by James E. Norton, 17 October 1966. The single specimen was collected alive; the operculum was in place but efforts to extract the operculum and body after soaking in trisodium phosphate solution were unsuccessful.

Discussion—*Agathodonta nortoni* is smaller than the Cretaceous *A. dentigera*, for which Orbigny gave a height of 18 mm. It further differs from *A. dentigera* in having the interior of



FIGS. 1-3. *Agathodonta nortoni* new species, holotype; shell length 10.6 mm. 1, Apertural view; the uppermost columellar plication does not show in this view; 2, Oblique dorsal view; 3, View perpendicular to the plane of the aperture, showing the two columellar plications, a notch and bordering node below the lowermost plication, the apertural ridge and strong lirae.

the outer lip thickened and prominently liriate, rather than thin and smooth.

Although I prefer not to base new species on single specimens, this species can be confused with no other. I therefore make an exception to call attention to the record of this genus in the Recent fauna.

The name commemorates the late James E. Norton, whose collecting in the Philippines during the 1960s has greatly enhanced the research potential of the LACM mollusk collection.

(Note Added In Proof)

In a recently published paper, Guidastrì *et al.* (1984) transferred *Putzeysia* Sullioti, 1889, from the Calliostomatinae to the Margaritinae, noting that the Mediterranean species *P. wiseri* (Calcare, 1842) has many features of such genera as *Danilia* Brusina, 1865, and *Miracelus* Woodring, 1928, except for lacking the columellar tooth of these genera. *Putzeysia* is evidently another member of the tribe Chilodontini, one lacking apertural dentition, as does *Euchelus* Philippi, 1847.

Acknowledgments

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CRITIQUE ON STENZEL'S BOOK ON THE OSTRACEA

David Nicol

Box 14376, University Station
Gainesville, Florida 32604

ABSTRACT

Stenzel assumed that the Ostracea are diphyletic and that the Gryphaeidae and the Ostreidae arose independently from two similar but different ancestral groups. Although the fossil record of the Ostracea is excellent, the stratigraphic evidence tends to refute Stenzel's assumption. It is more likely that the Gryphaeidae appeared first and that the Ostreidae arose later from a gryphaeid ancestor. The Ostracea are a distinctive group and appear to be monophyletic.

Stenzel (1971) subdivided the superfamily Ostracea into two families, five subfamilies, three tribes, and more than 50 genera and subgenera. This includes both fossil and living taxa, and the fossil record of the Ostracea is excellent because the shell is commonly thick and composed of resistant calcite. Furthermore, the

Ostracea live in shallow seas where the fossil record is best. Stenzel did not analyze his extensive data of these groups stratigraphically. If one looks at the geologic ranges of the families, subfamilies, and tribes, one will see a significant fact (Fig. 1). All of the taxa above the generic level appeared no later than the middle Cretace-